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does not think the experiment conclusive, with regard to the existence of oxygen as an ingredient essential to the constitution of ammonia.

New analytical Researches on the Nature of certain Bodies, being an Appendix to the Bakerian *Lecture for* 1808. *By* Humphry Davy, *Esq. Sec. R.S. Prof. Chem. R.I.* [*Phil. Trans.* 1809, *p.* 450.]

Mr. Davy, having in the experiments described in the late Bakerian lecture, found that a quantity of nitrogen disappeared during the action of potassium on ammonia, and that it could not be made to resume its gaseous state but by the agency of oxygen in water, has been from that time much occupied in determining, with certainty, all the circumstances of the process; and though he cannot yet speak with precision as to the quantities, he thinks the general results decisive with respect to a decomposition of nitrogen having been effected.

When potassium is heated in ammoniacal gas, it becomes an olive-coloured fusible substance, losing all its metallic properties, a quantity of hydrogen is evolved, and ammonia disappears.

In the Bakerian lecture it was stated, that upon heating the olive-coloured substance a part of the ammonia is recovered; but when all moisture is carefully excluded, this quantity of ammonia does not amount to one tenth part of the quantity absorbed; and even this quantity appears to be owing to the almost unavoidable presence of moisture or oxygen.

In the present experiments, after taking all possible care to exclude moisture, since the glass of the vessels might possibly yield oxygen when in contact with potassium, a small tray of platina, containing the potassium intended to act upon the ammonia, was introduced into a retort containing the gas, and afterwards transferred expeditiously into a clean iron or platina tube made air tight, and furnished with a stop-cock.

In one experiment it was ascertained that $12\frac{1}{2}$ cubic inches of ammonia are decomposed by nine grains of potassium, and evolve $8\frac{1}{4}$ of hydrogen.

In a second experiment, instead of reserving the gas for experiment, an equal quantity of potassium was used, and immediately transferred into an iron tube. The tube being then filled with hydrogen, and connected with a mercurial apparatus, was heated gradually. The quantity of gas collected previously to its acquiring a red heat, amounted to $9\frac{1}{2}$ cubic inches, and four inches more were collected by raising the heat to whiteness. Of the former portion, about three fourths of an inch were ammonia; the remainder of the gas consisted of hydrogen and nitrogen, in the proportion of 8 to 3; so that the total quantity of hydrogen collected in this analysis, amounted to $16\frac{1}{2}$ inches, and the nitrogen to three cubic inches. If the same quantity of ammonia had been decomposed by electricity, it would have yielded 15 of hydrogen, and 6 or 7 of nitrogen; so that in the present experiment there was a loss of between three and four inches of nitrogen to be sought in the residuum which had been heated in the metallic tube. But when the tube was opened, nothing was found but potash that had been fused, and a small quantity of potassium sublimed into its upper part; so that in the place of the nitrogen nothing was found but oxygen contained in the potash, which, together with a small excess of hydrogen, may amount to the weight of the nitrogen lost.

In other experiments five grains of the olive-coloured ammoniacal pyrophorus, formed by potassium, yielded by mere heat, or by oxygen, three fourths of an inch of nitrogen; but by water they evolved one fifth of hydrogen, and $3\frac{1}{4}$ of ammonia, which by estimate contain $1\frac{1}{2}$ of nitrogen.

If the nitrogen is to be considered as converted into oxygen and hydrogen, it must be regarded as containing much more oxygen than water; and if we do not adopt this supposition, Mr. Davy considers the only alternative to be, that water is the ponderable matter which, under different modifications of electro-chemical existence, constitutes oxygen, hydrogen, nitrogen, and the nitrous compounds; but with respect to conclusions so important, and so little to be expected by any analytical chemist, it appears to Mr. Davy highly unphilosophical to decide in the present state of our knowledge.

The Croonian *Lecture. By* William Hyde Wollaston, *M.D. Sec. R.S.* Read November 16, 1809. [*Phil. Trans.* 1810, *p.* 1.]

Since the remarks, which the author has connected together on the present occasion, as tending, each of them, to promote the design of Dr. Croone, do not appear to bear any direct relation to each other, he divides the lecture into three distinct heads; the first of which contains an observation, and some experiments on the duration of muscular action. In the second he traces the origin of sea-sickness, from a mechanical cause deranging the circulation of the blood. In the third he offers a mechanical explanation of the advantages derived from riding, and the various modes of carriage exercise.

With regard to the duration of muscular action, the author is of opinion that each effort, apparently single, consists in reality of a great number of contractions, repeated at extremely short intervals. He infers the existence of these alternate motions, from a sound observed upon inserting the extremity of the finger into the ear. The sound resembles that of carriages at some distance passing rapidly over a pavement. The sound is not perceived when the force applied to stop the ear is not muscular, unless the action of some distant muscle be communicated through some medium capable of conveying its vibrations.

With a view to estimate the frequency of these vibrations, the author contrived to imitate them by rubbing a stick, regularly notched, and placing it in such a position, that the tremor was communicated to the ear along with the muscular vibrations. The results of such